IEEE P802.11
Wireless LANs
Interpretation requests

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Interpretation request from Henri Moelard:

I have tried to understand the material specified in Annex D of the approved draft standard of 802.11 and came across a few syntax errors (sequence numbers and in variable groupings) and the following differences in text between the annex and the body of the standard:

1. The StationConfig group is inconsistent in clause 11 and annex D.

2. The Privacy group is inconsistent in clause 11 and annex D.

3. The Counters group is inconsistent in clause 11 and annex D.

4. The PHY Operations group is inconsistent in clause 13 and annex D.

5. The supported data rates are inconsistent in clause 13 and annex D.

6. The supported CCA modes (DS PHY) is inconsistent WITHIN annex D.

7. Various attribute DESCRIPTIONS are inconsistent in clause 13 and annex D. (e.g. aRTSThreshold in agOperationGroupEntry and in 11.4.4.2.15).

8. Various attribute DESCRIPTIONS use the term "frame". It is not clear what this is, an MPDU (fragment), or an MSDU/MMPDU.

9. Annex C includes definitions for the subset of the MIB attributes needed by the MAC state machines. The comments state that these definitions are placeholders, to satisfy SDL's strong type checking in the absence of a Z.105-compliant tool which can use the ASN.1 definitions from Annex D. However, the MAC MIB and subset of the PHY MIB which appear in Annex C match closely the MIB summaries in Clauses 11 and 13, and differ substantially from the definitions in Annex D.

10. There are numerous inconsistencies in element numbering, both between clauses 11 & 13 and annex D, and within annex D -- including syntax errors where more than one numeric string appears for a single number, duplicated numbers, and numbers not in sequential order.

11. The conformance information at the end of Annex D is inconsistent with Annex A, since D shows no mandatory groups, whereas A shows several mandatory management groups and several others that are mandatory if options (such as WEP) or particular PHY types are present. Also, the conformance groups in D are not consistent with the grouping elsewhere.

12. On page 225 of D6.1, clause 14.6.8, set definition for North America/most of Europe, line 3 [x = {2,5,8,...,72,74,77}]. Pattern 72 is already shown in set 1, while 71 is not given in any of the sets. I believe that the number 72 is not correct and should be 71.

Disposition of request from Henri Moelard

1-7, 9-12   The standard states that the Management Information Base (MIB) has to conform to clauses 11, 13 and annex C, and users have to conform to this. However, the rules for implementing the MIB in GDMO and in ASN-1 result in conflicting specifications.   Therefore, the sponsor has been asked to take possible action at the next revision.

8   TBD

Interpretation request from Johnny Zweig:

1. I would like to receive clarification of some parts of 802.11 D6.1 that are inconsistent.

   The ambiguity is with respect to the FH Parameter Set element, defined in 7.3.2.3. The exact semantics and range of Hop Set, Hop Pattern and Hop Index are unclear.

   Specifically, 14.6.8 gives a mathematical formula for the channel number based on the pattern (x) and index (i). The variable x takes on values between 0 and 77, and its range (as expected) is different for each regulatory domain. The sets are explicitly numbered from 1 to 3.

   14.8.2.1.38 defines aCurrentSet as taking the range 1 to 3 (as I would expect), but 14.8.2.1.39 defines aCurrentPattern as taking on a value between 1 and 26. 14.8.2.1.40 defines aCurrentIndex as taking values in the range of 1 to 26 (clearly incorrect, since there are 79 frequencies in the North American/ETSI hopping patterns). The text is unclear, but would make the most sense if we interpret aCurrentPattern as being the index into the set of patterns in the set aCurrentSet.

2. I would like an interpretation of what the valid range of values for the fields in the FH Parameter Set element as well as the semantics of aCurrentSet, aCurrentPattern and aCurrentIndex. That is, I would like the precise mapping of the information in the FH Parameter Set to frequency.

   The standard does not specify what should happen in the case of invalid combinations of Hop Set and Hop Pattern (if the interpretation is that Hop Pattern can be a number between 0 and 77, the Hop Pattern modulo 3 (plus 1) must equal Hop Set). I suspect implementations would follow "Postel's Dictum" and be tolerant of such errors, and since there does not seem to be a result from the MLME-SCAN.confirm primitive (clause 10.3.2.2) where it can report a Beacon or Probe Response with invalid PHY Parameter Set element, it might be difficult to specify what ought to happen. But given the ambiguity, it is conceivable to me that erroneous implementations may exist.

3. A number of settings (ESSID in particular) are no longer in either MIB, even though they obviously are of interest to system administrators. I assert that anyone interested in the WEP ICV error count at a station also cares what ESS it belongs to, whether it is in infrastructure mode, etc. I know a bunch of things departed the MIB and ended up as parameters to primitives in clause 10 (heck, I wrote half that text myself!), but now that it comes to defining how an SNMP manager controls that information, I am dismayed.

Disposition of request from Johnny Zweig

1. The standard states that aCurrentPattern as taking on a value between 1 and 26. And that aCurrentIndex is taking values in the range of 1 to 26, and users have to conform to that. However, concerns have been expressed about this and the sponsor is taking possible action at the next revision (see doc.: 97/154, clause 1 and 2)
2. TBD
3. TBD

Interpretation request from Matt Fischer:

Note that the general drift of this clarification request is an echo of Johnny's clarification request, with the additional request of a tie-in of the FH parameter element definition to the MIB values.

THERE IS A SERIOUS PROBLEM WITH THE aCurrentPattern SPECIFICATION.

At first, I too, thought that the answer to your question 3 was trivial. However, quite by accident, I noticed that immediately preceeding 14.8.2.1.40 is 14.8.2.1.39, which describes exactly the same range for the aCurrentPattern. I.e. 1 through 26. This range for aCurrentPattern may be correct, however, what is missing is the relationship among three items, not just the two that you gave.

I.e. what is the relationship among the following:

the value of the octet HOP PATTERN in the FH PARAMETER SET the MIB aCurrentPattern
the current pattern 'x' as used in 14.6.8
It is quite clear that the description in 14.8.2.1.39 now reads that the aCurrentPattern has a value from 1 through 26.

It is also quite clear that restricting the current pattern 'x' to this range of values in 14.6.8 would be terribly wrong. In order to get a proper hop sequence when a value is substituted for 'x' in the equations for the hopping sequences, the current pattern 'x' must use the entire range of 0 through 77 (which, interestingly, doesn't match the range of the hop index, which is 1 through 79!)

So, now, which 'pattern number' does the FH PARAMETER SET get? It does, I hope, match either one of the two that I've described, as opposed to yet another, third scheme.

Frankly, I vote for what I think Johnny hints toward in his email, which is that the FH PARAMETER SET SHOULD HAVE A NUMBER FOR HOP PATTERN IN THE RANGE OF 0 through 77.

NOTE - This is what I'd thought the document said all along. It turns out that the document was rather vague, and in the last edit, an attempt was made to solve the vagueness(??) and the attempt failed. I've always thought to myself, that there is ABSOLUTELY NO NEED for the CURRENT SET
parameter of the FH PARAMETER SET, because if the PATTERN number is given in the range of 0 through 77, no SET number is needed!

If the point of having the SET number was to allow the use of the range 1 through 26 for the aCurrentPattern MIB, and then to use a level of indirection in order to get to the pattern number 'x' to be substituted into the sequence equation, then the wording of 14.6.8 needs to change - because
as it stands now, there's a contradiction, which even Dean Kawaguchi seems to have missed.

Now, if anyone would like to argue that the FH parameter Set element definition should resolve this, that one isn't there either. There is NO mention of any MIB in the definition of the fields for the FH parameter set element in 7.3.2.3

MY CHOICE:

aCurrentPattern: 0 through 77
FH PARAMETER SET CURRENT PATTERN OCTET: 0 through 77

aCurrentIndex: 1 through 79
FH PARAMETER SET CURRENT INDEX OCTET: 1 through 79

aCurrentSet: 1 through 3
FH PARAMETER SET CURRENT SET OCTET: 1 through 3

Note that the FH PARAMETER SET definition should make a direct reference to some other item in the document - like it should either specifically state that the CURRENT PATTERN should have the value of the MIB parameter aCurrentPattern, or it should have one of the values from the three sets of pattern numbers as described in 14.6.8. This would make the relationships unambiguous. There are other alternatives that would also clear up the ambiguity.

There're two more things that need to be clarified in the FH parameter set and FH hopping description:

1. 14.6.8 has an equation for determining the sequence of channels in a pattern.

   I believe that the equation should use a lower case "i" instead of an upper case in the left hand side.
   I.e. it currently reads fx(I) = ...
   I believe it should read fx(i) = ...

   There is no definition for "I" anywhere.

2. Back in 14.6.4, there is a table which has one column labelled "Hopping Set" This column really seems to indicate the total number of channels that must be included within any given pattern. The term "set" is used elsewhere to describe a group of "hopping sequences". Confusion is created with the conflicting uses of this term. The column heading in the table should probably say something more along the lines of "number of channels in each pattern."

Disposition of request from Matt Fischer

1.   The standard is unclear on this issue, but no distinction could be made between alternative implementations based on this issue. This is being referred to the sponsor for possible action at the next revision. (see doc.: 97/154, clause 3)
2.   TBD

Interpretation request from Anil Sanwalka:

1.   The final standard indicates that the IR PHY has different sets of TX and RX supported rates. The requirements are that all conformant PHYs must be able to transmit at 1 Mbit/s, and all conformant PHYs must be able to receive at 1 and 2 Mbit/s.

     So what is the BasicRateSet used by the MAC for the IR PHY. It seems to me that the only way to support the above requirements is if the BasicRateSet is 0Ah (1 Mbit/s) only.

2.   In clause 13.1.4.42 the description of the MIB attribute aCurrentChannelNumber states "The current channel number of the frequency output by the RF synthesizer".

What does this mean? Which RF synthesizer?

Disposition of request from Anil Sanwalka

1. The standard is not clear on this issue and users need to limit the basic rate to OAh. However, concerns have been expressed about this and the sponsor is taking possible action at the next revision (see doc.: 97/154, clause 5 and 6)
2. TBD

Interpretation request from Bob O'Hara:

1. In clause 8.3.2 of IEEE Std. 802.11-1997, paragraph three states that the MA-UNITDATA-STATUS.indication will return "undeliverable - cannot encrypt with a null key" under certain specified conditions. Such a status indication does not exist in clause 6.2.1.3, the description of the MA-UNITDATA-STATUS.indication.

   Is this status supposed to be passed across this interface, or not?

Disposition of request from Bob O'Hara

1. The standard is unclear on this issue, and as such no distinction could be made between alternative implementations based on this. This has been referred to the sponsor for possible action at the next revision. revision (see doc.: 97/154, clause 4)